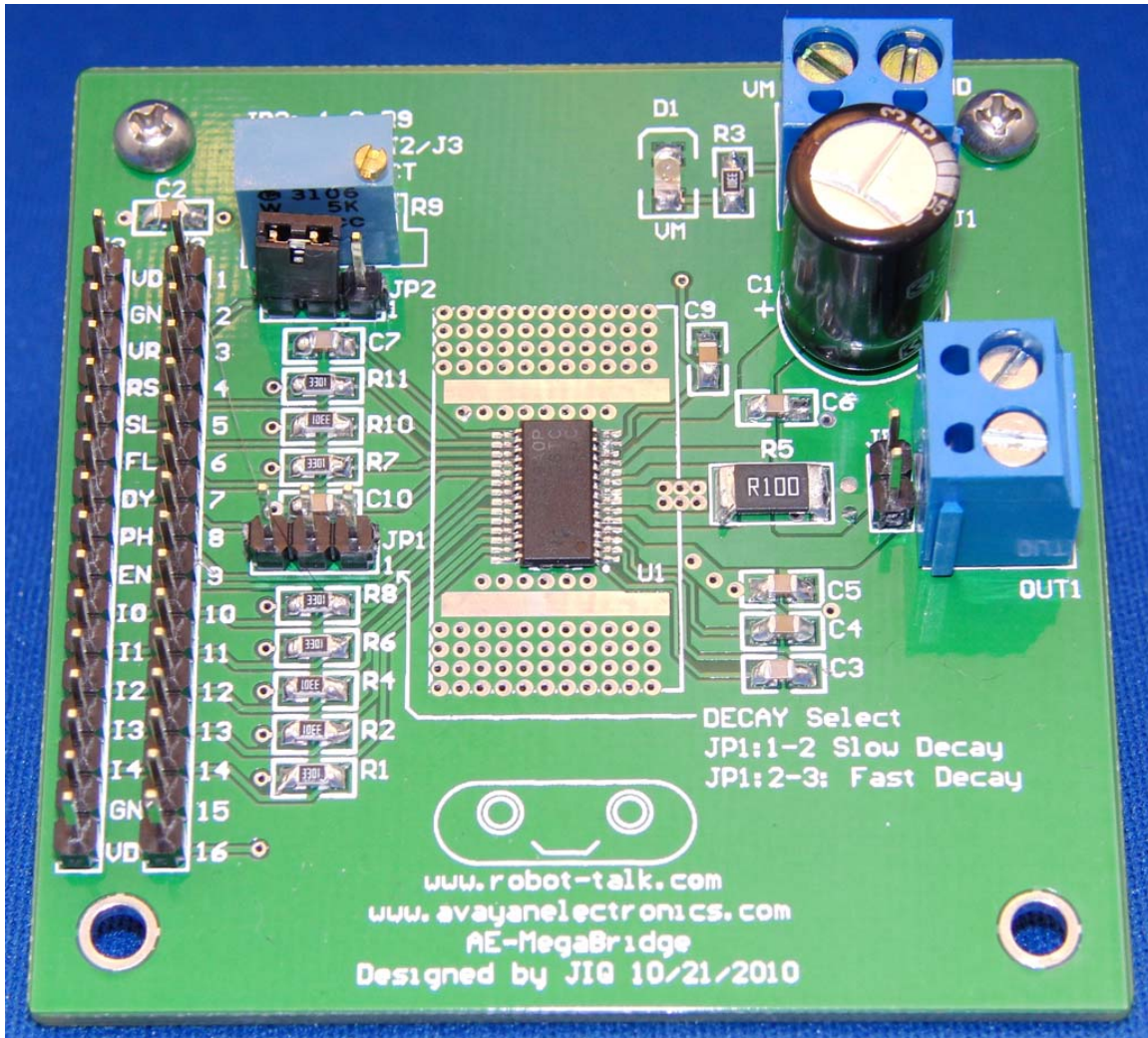
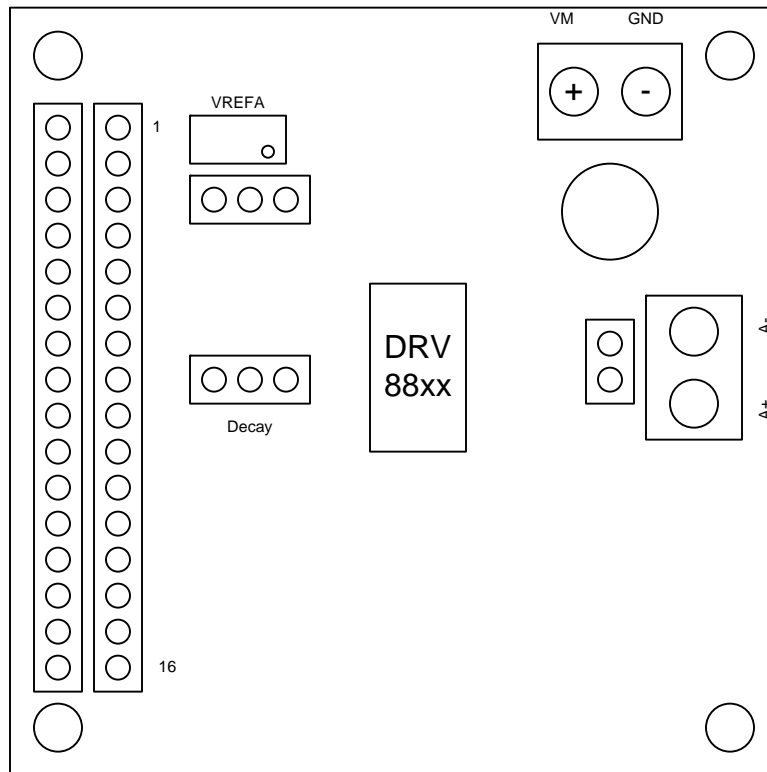


AE MegaBridge Manual



3A or 5A Single DC Motor Controller



AE-MegaBridge:

- Controls 1 large DC motor (up to 5A).
- Easy access to all signals. Two different flavors documented on the back side.
- Selectable reference voltage to either external access, or internally derivable through a potentiometer (JP2).

Ease of Use Features:

- Input power wires and power outputs screwed into terminal block.
- Measures 2.5" by 2.5"
- Dual 16 pin header connector offers easy access to signals. Second header can work of as an access point to a second board or test stakes for in application monitoring.
- All possible combinations tackled by the use of potentiometers and jumpers.
- Control signals pulled up by means of 3.3K resistors.

Description:

The AE-MegaBridge is the most flexible single DC motor control module you will ever find. Measuring only 2.5" by 2.5" this module can handle a single inductive load with up to 5A worth of current.

The "secret" is a new family of drivers with different functionality but identical pinout, from Texas Instruments, which consists of drivers such as the DRV8828/29/40/42. The different flavors are:

DRV8828 Flavor: Single H Bridge with increased current capability for driving many different inductive loads by using the ENABLE/PHASE interface. Two of these can be used to drive larger steppers.

DRV8842 Flavor: Single H Bridge with increased current capability for driving many different inductive loads by using the IN1/IN2 interface. Two of these can be used to drive larger steppers.

Other than the differences mentioned above, all of these devices offer the exact same features:

1. Current control engine to regulate current. Vital for stepper driving and torque control on DC motors.
2. Selectable slow, fast or mixed current decay modes.
3. Over Current Protection and fault signaling.
4. Identical pinout, allowing for completely different devices to be soldered into the very same board!



Control Signals and AE-MegaBridge Header pinout:

J2 and J3 pins	DRV8828/29/40	DRV8842
1	VDD	
2	GND	
3	VREF	
4	nRESET	
5	nSLEEP	
6	nFAULT	
7	DECAY	
8	PHASE	IN1
9	ENABLE	IN2
10	I0	
11	I1	
12	I2	
13	I3	
14	I4	
15	GND	
16	VDD	

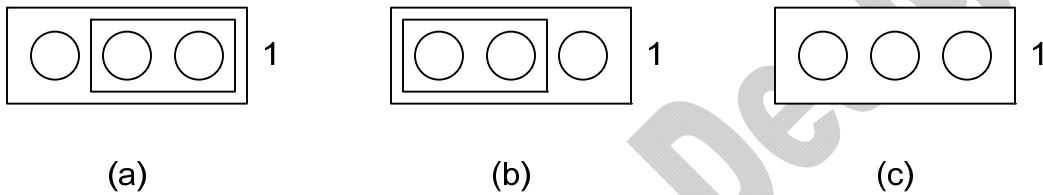
Open Source Design

Jumper Configurations:

Jumpers will allow the configuration of the reference voltage selection and DECAY mode.

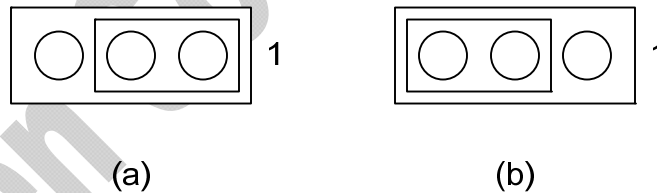
Jumper JP1 can be used to select SLOW (LO) or FAST (HI) decay mode by using a shunt as described below. If a shunt is not placed on any of the two possible positions (jumper is left open) device defaults to MIXED decay mode. In this last scenario it is also possible to drive the DECAY pin through the J2/J3 available connection.

Jumper JP1 (DECAY Select):



JP2 Position	Diagram	VREF A Source
JP1:1-2	(a)	Slow Decay
JP1:2-3	(b)	Fast Decay
JP1:NONE	(c)	J2/J3 or Mixed Decay

Jumper JP2 (VREF Select):



JP2 Position	Diagram	VREF A Source
JP2:1-2	(a)	Potentiometer R9
JP2:2-3	(b)	Headers J2 or J3

Users may want to utilize an internal VREF source as offered by the potentiometer, or may prefer to couple an external analog voltage as a reference voltage source through the available J2/J3 connector.

Control Signals Description:

Control Signal	Direction	Description
All Devices		
VDD	Power	3.3V power supply must be provided on this power rail
nRESET	Input	Clears the internal logic on the device. If an over current protection has shut down the driver, a low on this pin clears the fault and resumes operation.
nSLEEP	Input	A LO level on this pin places the device on low power mode.
nFAULT	Output	Open Collector output which signals if a fault has occurred (Thermal Shutdown, Over Current, etc.)
VREF	Analog Input	Configures ITrip Max Current according to the equation $ITrip = VREF / (5 * RSENSE)$
DECAY	Input	Specifies Current Recirculation Scheme. A LO configures for Slow Decay mode. An OPEN (or NC) configures for Mixed Decay mode. A HI configures for a Fast Decay mode
Ix	Input	Current Select Bits. On the single H Bridge flavor, these five bits select from one of the 32 possible current levels. Use these bits if you want to microstep a large stepper motor.
H Bridge PHASE/ENABLE Interface		
PHASE	Input	Selects direction of current flow on the H Bridge driving an inductive load.
ENABLE	Input	A LO on this pin disables the H Bridge. A HI on this pin enabled the H Bridge.
H Bridge INx Interface		
IN1	Input	Selects whether OUT1 is HI or LO
IN2	Input	Selects whether OUT2 is HI or LO